

199-N-49 (A4692) Log Data Report

Borehole Information:

Borehole: 199-N-49 (A4692)		Site: 100-NR-2			
Coordinates (WA St Plane)		GWL¹ (ft): 65.3		GWL Date: 04/25/06	
North 150050.34 m	East 571991.69 m	Drill Date 07/85	Elevation (TOC) Not available	Total Depth (ft) 65	Type Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	2.2	8 5/8	8	5/16	2.2	49
Screen	None	Not available	Not available	0.22	49	65

Borehole Notes:

Casing diameter and stickup measurements for the 8-in. casing were acquired using a caliper and steel tape. Measurements are rounded to the nearest 1/16 inch. The screen data are for typical stainless steel screens used at Hanford. The top of screen depth is assumed on the basis of the total gamma log where the count rate increased. Hanford Wells reports the screen from 55 to 65 ft. Grout reported to exist from the ground surface to approximately 20 ft is confirmed by the moisture logging. Logging data acquisition is referenced to the top of casing (TOC).

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System: Gamma 1N		Type: SGLS (60%) SN: 45TP22010A	
Effective Calibration Date: 04/05/06	Calibration Reference: DOE/EM-GJ1183-2006		
	Logging Procedure: MAC-HGLP 1.6.5, Rev. 0		

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System: Gamma 4F		Type: SGLS SN: H310700352	
Effective Calibration Date: 02/27/06		Calibration Reference: DOE/EM-GJ1141-2006	
		Logging Procedure: MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3 Repeat		
Date	04/25/06	04/26/06	04/26/06		

Log Run	1	2	3 Repeat		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	65.0	41.5	62.0		
Finish Depth (ft)	39.5	2.5	52.0		
Count Time (sec)	200	200	200		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	0.5	0.5	0.5		
ft/min	N/A ²	N/A	N/A		
Pre-Verification	AN015CAB	AN016CAB	AN016CAB		
Start File	AN015000	AN016000	AN016079		
Finish File	AN015051	AN016078	AN016099		
Post-Verification	AN015CAA	AN016CAA	AN016CAA		
Depth Return Error (in.)	- 0.5	+ 0.5	0		
Comments	No fine-gain adjustment	No fine-gain adjustment	No fine-gain adjustment		

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	4	5 Repeat			
Date	05/02/06	05/02/06			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	2.5	52.0			
Finish Depth (ft)	64.75	62.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
ft/min	N/A	N/A			
Pre-Verification	DF212CAB	DF212CAB			
Start File	DF212000	DF212250			
Finish File	DF212249	DF212290			
Post-Verification	DF212CAA	DF212CAA			
Depth Return Error (in.)	N/A	0			
Comments	No fine-gain adjustment	No fine-gain adjustment			

Logging Operation Notes:

Logging was conducted with a centralizer on each sonde. Measurements are referenced to the top of casing. Repeat sections were acquired in this borehole to evaluate the logging systems' performance.

Analysis Notes:

Analyst:	Henwood	Date:	07/06/06	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. Acceptance criteria were met.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated using the EXCEL worksheet templates identified as G1NApr06.xls and G4Feb06.xls for the SGSL and NMLS, respectively. A casing correction for 0.3125-in.-thick casing was applied to the SGSL data to 49 ft. Below 49 ft a correction for 0.22-in thick casing was applied. No corrections for dead time or water were required.

The NMLS data are not converted to percent moisture due to the lack of calibration data for the non-standard borehole size below 49 ft; the data are reported in counts per second.

Results and Interpretations:

¹³⁷Cs was detected at a few depth locations by the routine processing software near its MDL of approximately 0.2 pCi/g. Further analysis suggests the detections are statistical fluctuations and are not valid.

⁶⁰Co was detected continuously between 56 and 65 ft. The maximum concentration was approximately 0.3 pCi/g at 65 ft.

Depth to water was not reported (Hanford Wells) at the time of drilling in 1985, and is currently at approximately 65.3 ft. A screen is reported to exist between 55 and 65 ft. It appears the groundwater may have been contaminated and a residual amount of ⁶⁰Co remains. This ⁶⁰Co contamination could be adsorbed onto the casing, leaving a “bathtub ring” as the groundwater level receded.

The repeat sections for the SGLS indicate good agreement for the naturally occurring and man-made radionuclides. The repeat section for neutron moisture also showed good agreement.

List of Plots:

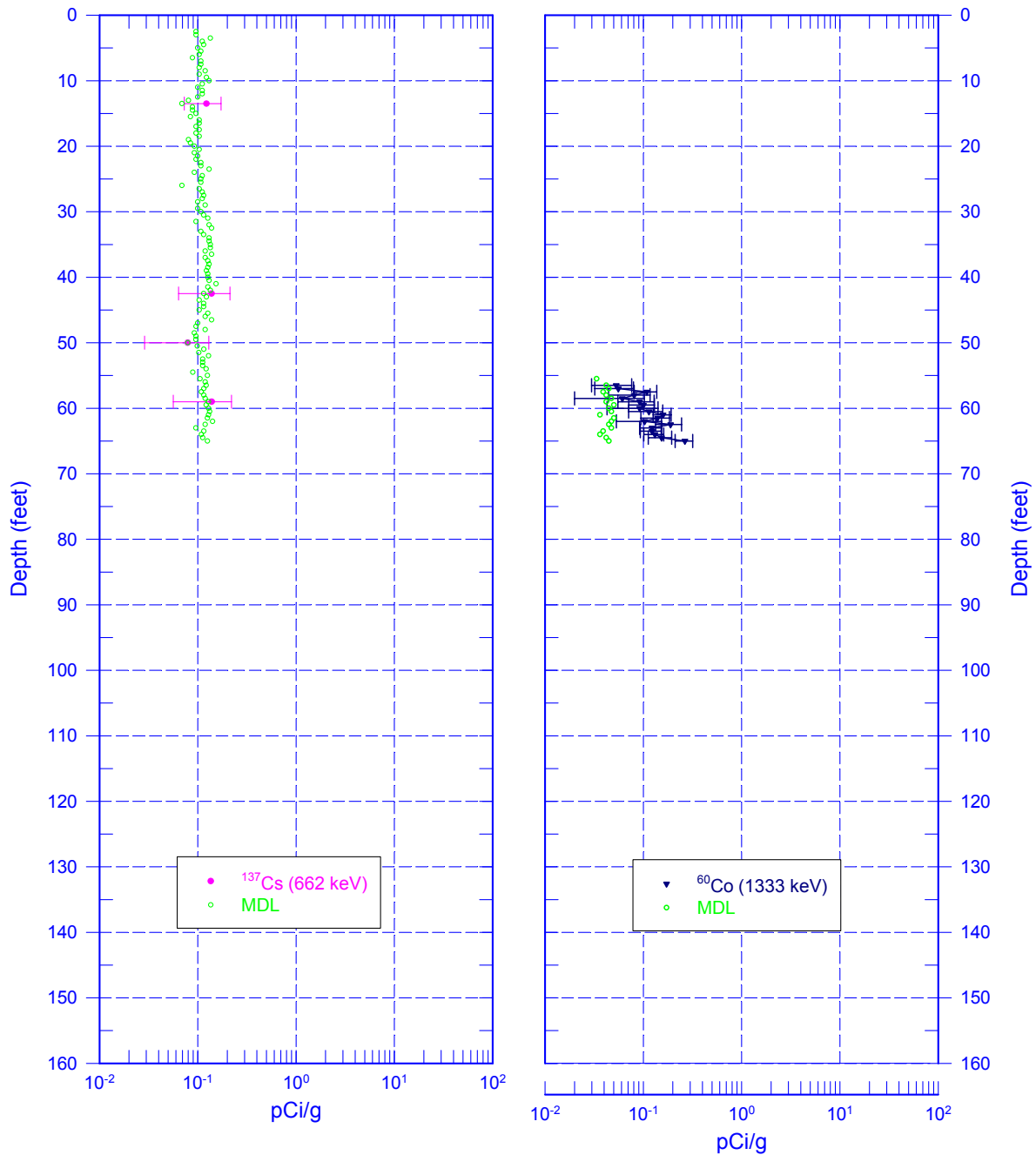
Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Moisture
Total Gamma and Dead Time
Repeat Section of Man-Made Radionuclides
Moisture Repeat Section
Repeat Section of Natural Gamma Logs

¹ GWL – groundwater level

² N/A – not applicable

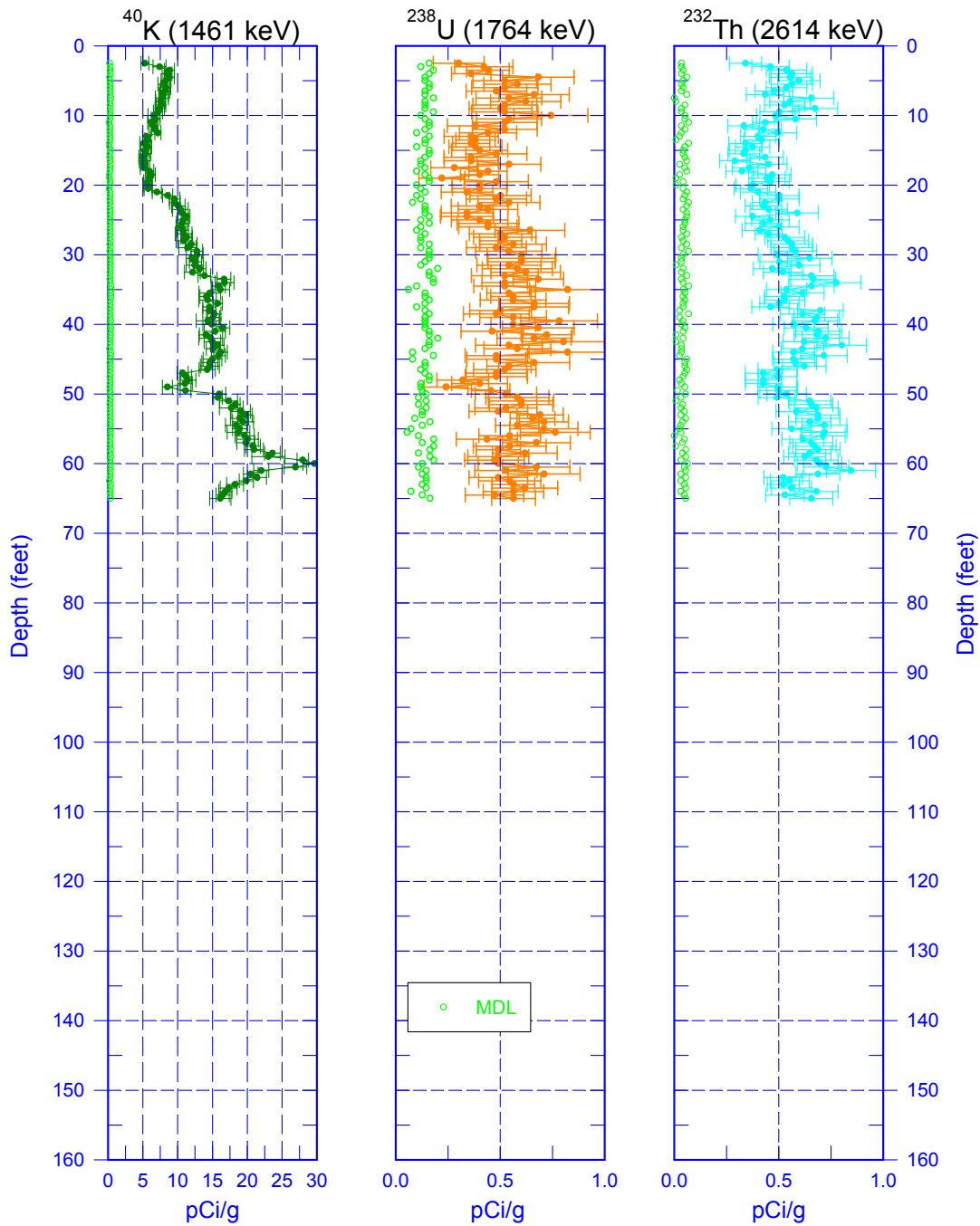
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Man-Made Radionuclides



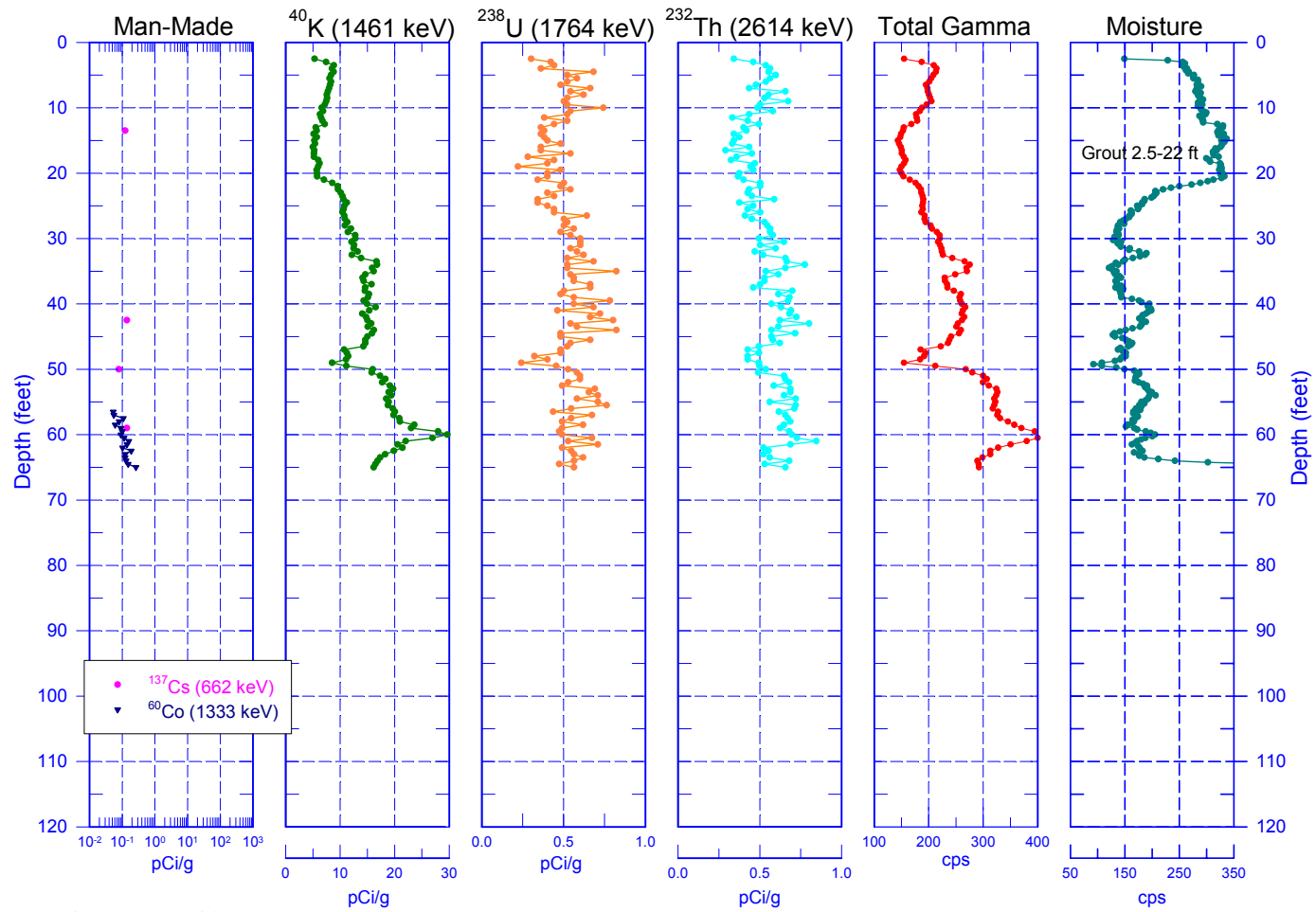
Zero Reference = Top of Casing

199-N-49 (A4692) Natural Gamma Logs



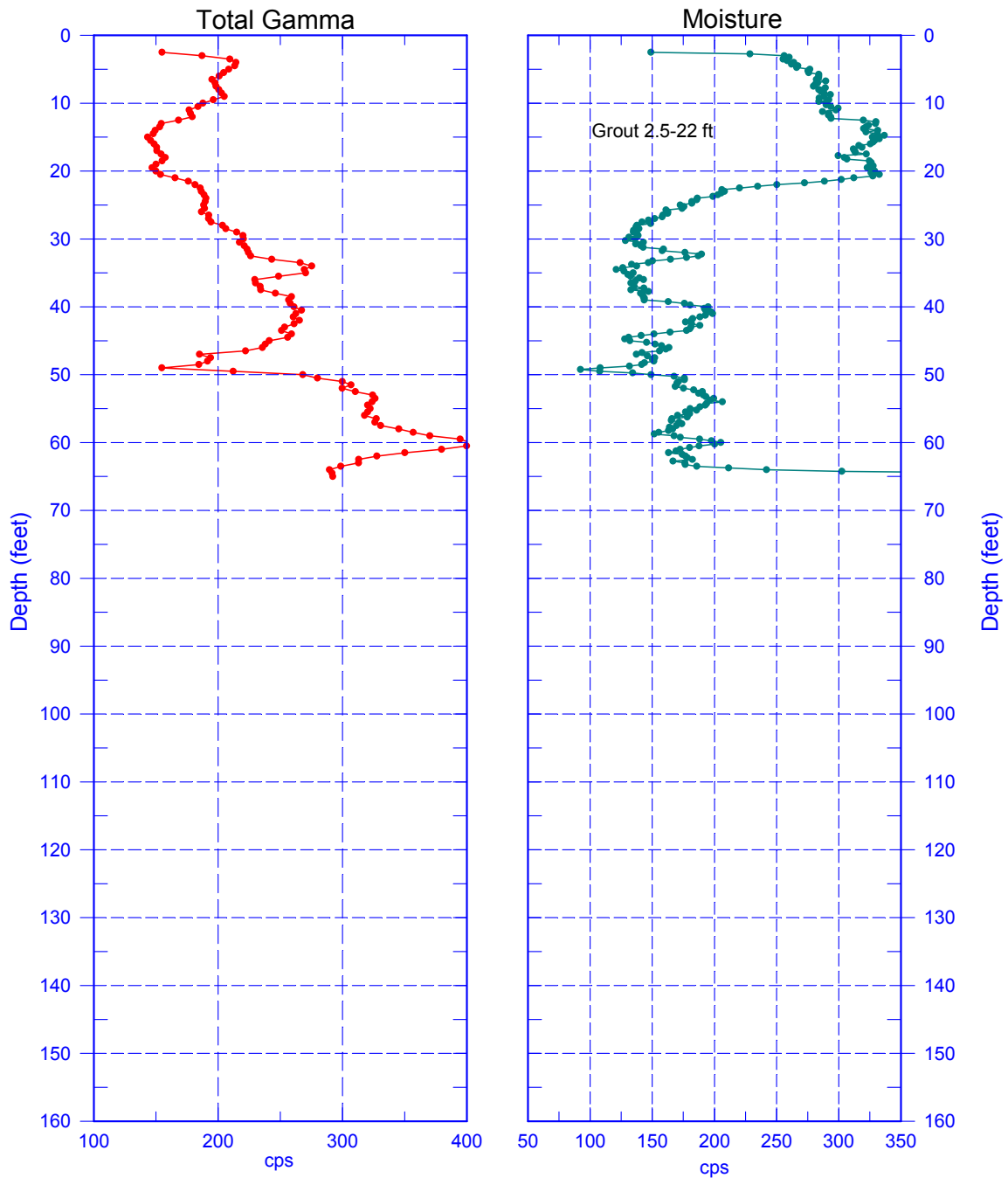
Zero Reference = Top of Casing

199-N-49 (A4692) Combination Plot



Zero Reference = Top of Casing

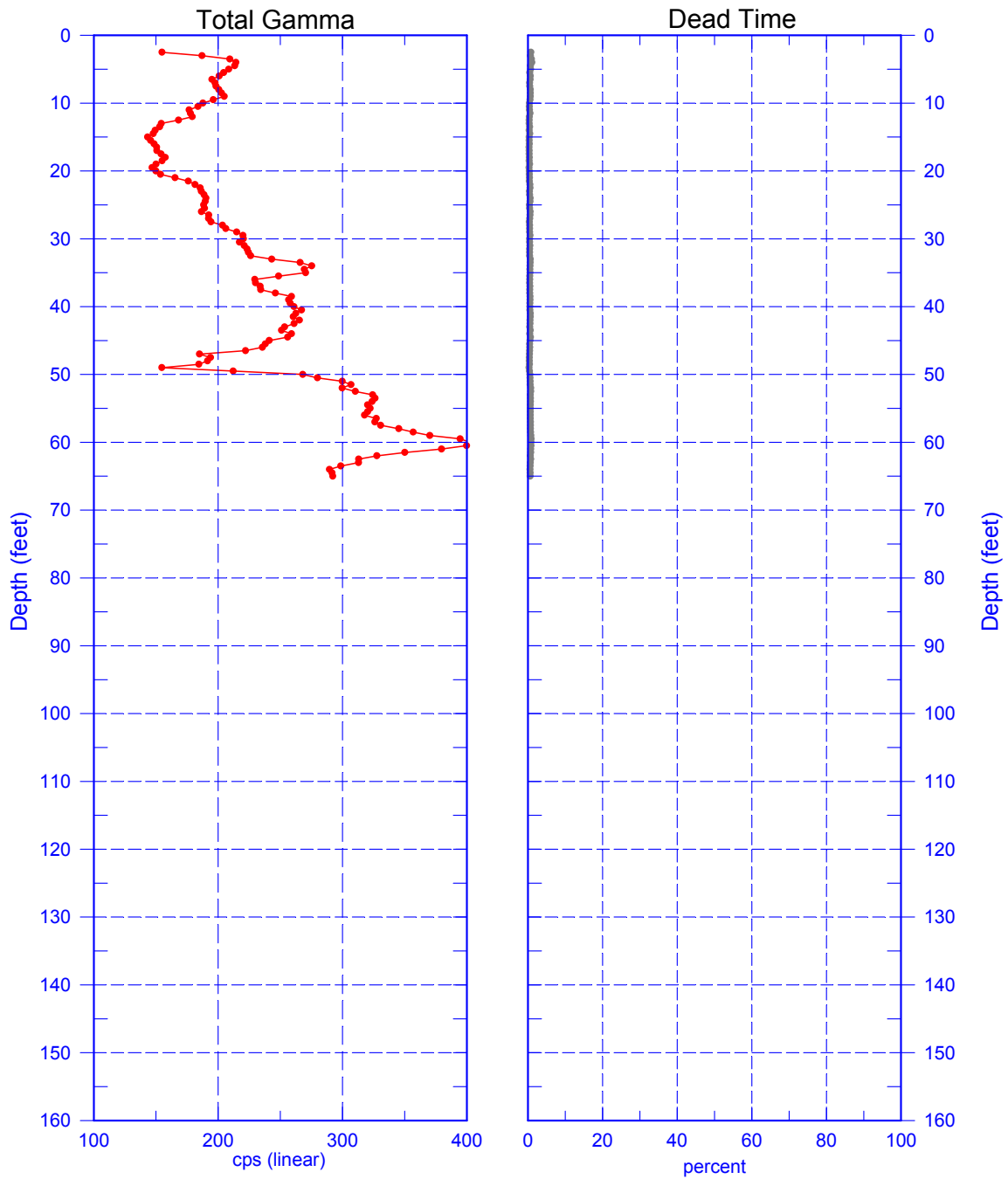
199-N-49 (A4692) Total Gamma & Moisture



Reference - Top of Casing

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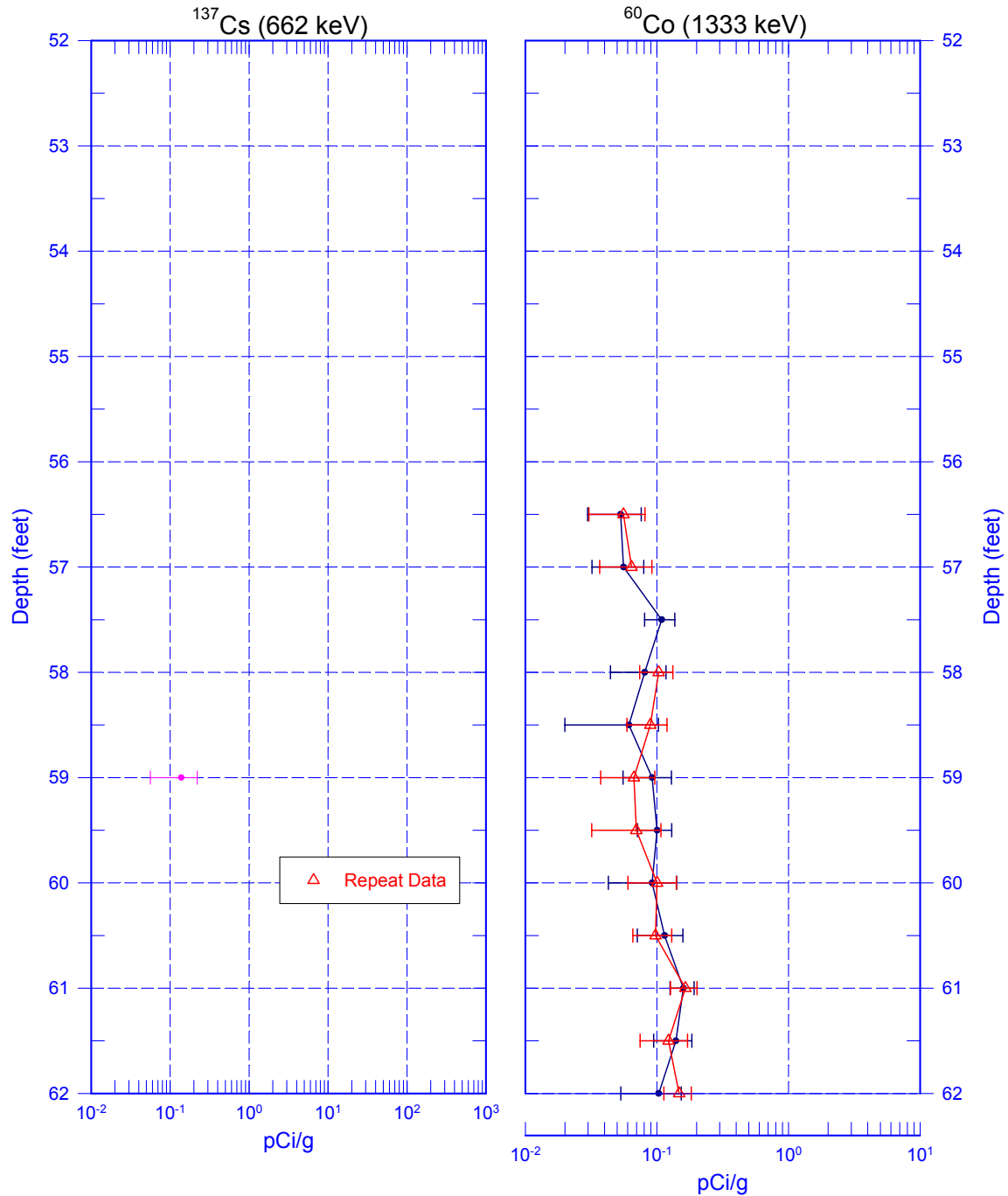
Total Gamma & Dead Time



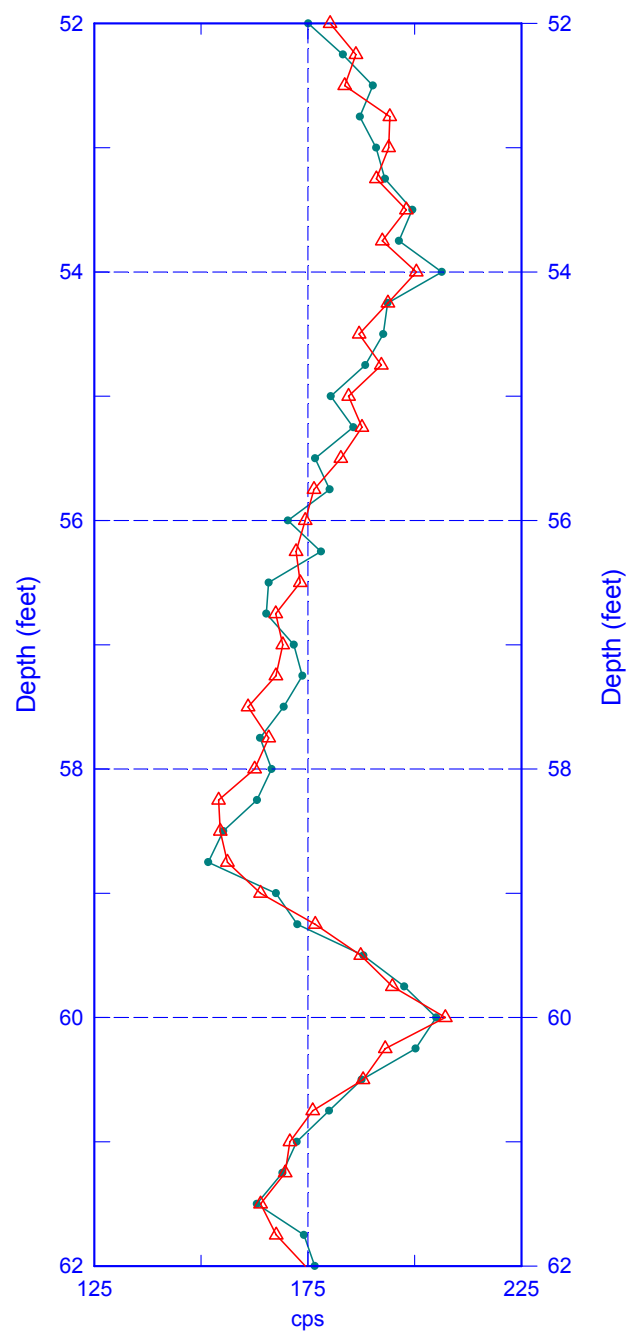
Reference - Top of Casing

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Repeat Section of Man-Made Radionuclides

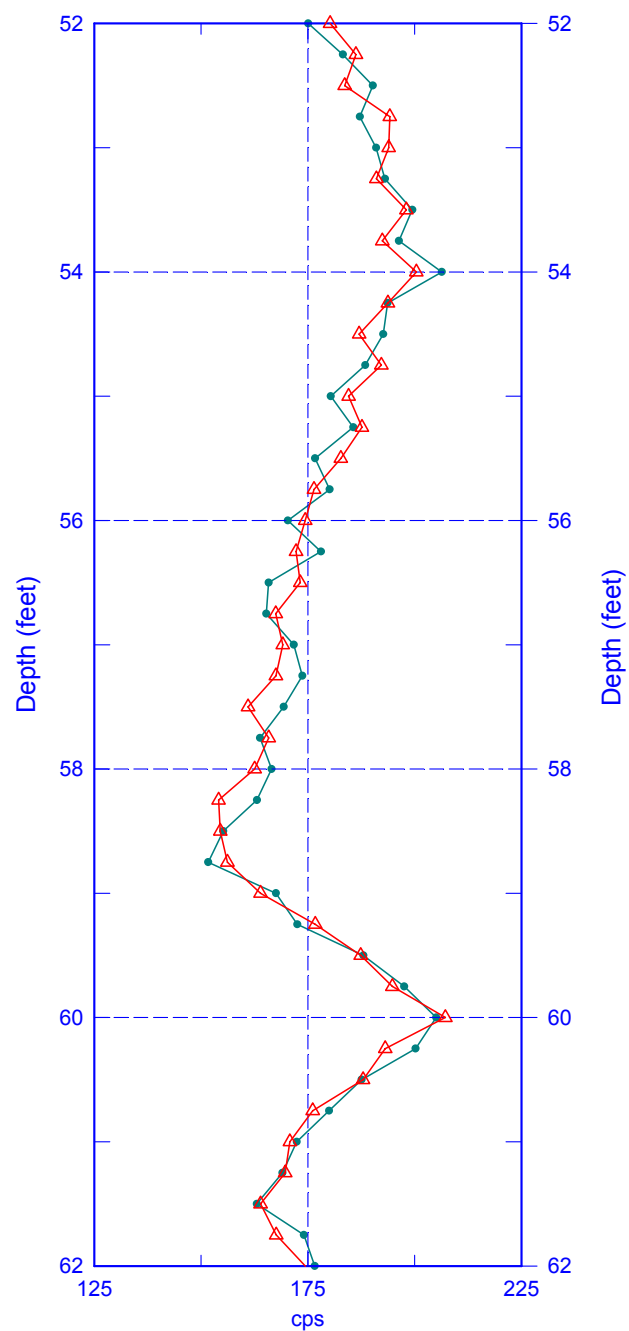


199-N-49 (A4692) Moisture Repeat Section



Reference - Top of Casing

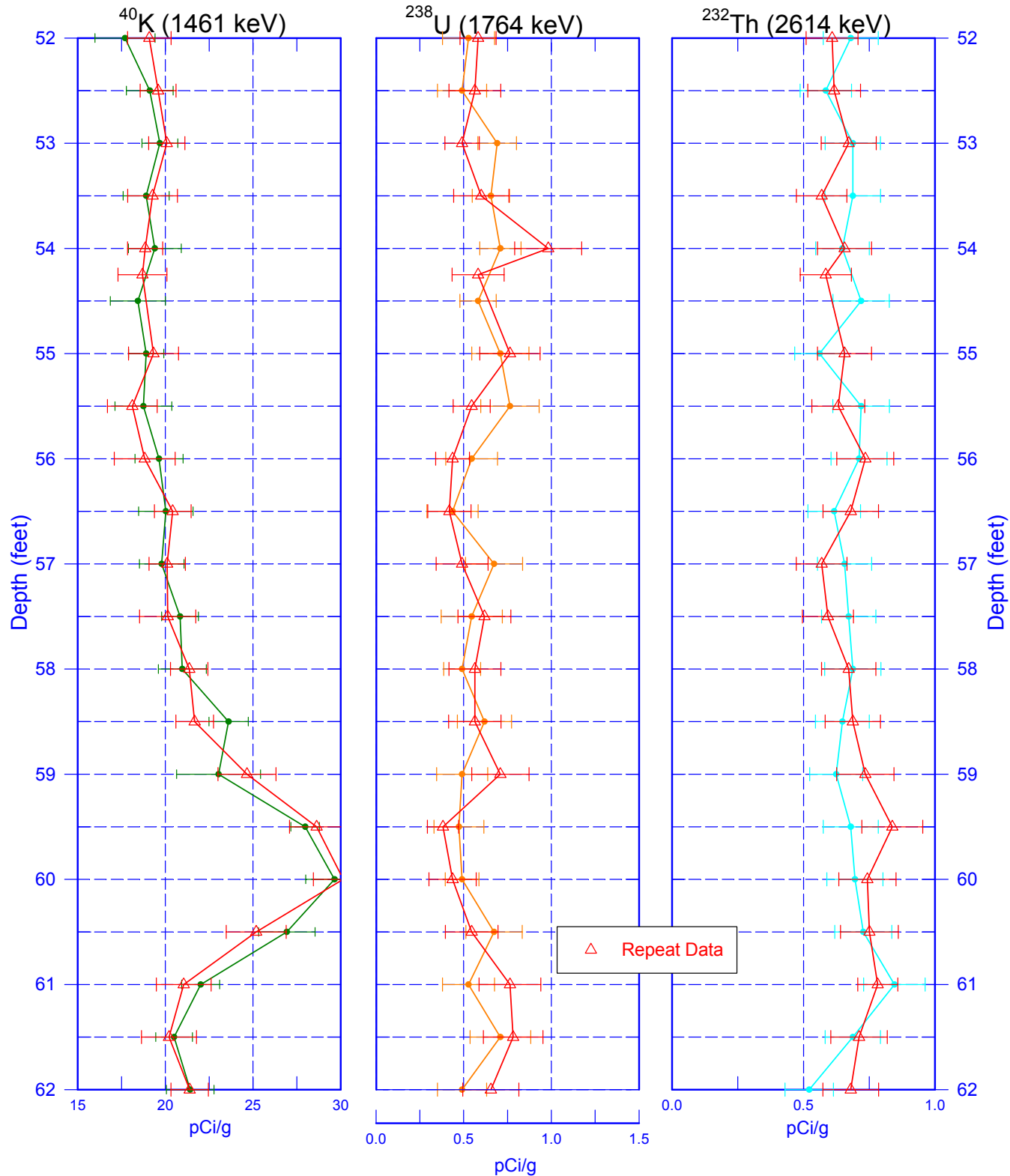
199-N-49 (A4692) Moisture Repeat Section



Reference - Top of Casing

199-N-49 (A4692)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing